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Tsuyonobu Hatazawa

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SONNENSCHN NATH & ROSENTHAL LLP

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EXAMINER

CREPEAU, JONATHAN

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1, 4, 5, and 8-11. Applicant's arguments regarding the rejection under 35 USC 112, first paragraph are persuasive and the rejection is withdrawn. However, the claims remain rejected under 35 USC 103 for substantially the reasons of record.

### ***Claim Rejections - 35 USC § 103***

2. Claims 1, 5, and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 895296 in view of Chaloner-Gill (U.S. Patent 5,445,856) in view of Bullock et al (U.S. Patent 5,219,676) in view of Gozdz et al (U.S. Patent 5,607,485).

Regarding claim 1, EP '296 teaches a nonaqueous electrolyte battery comprising a battery element (6) is contained in an outer covering member including a laminated film having an outermost layer and is sealed by heat seals. The laminate may be in the form of a single sheet, with the first and second covering members folded together and heat-sealed. The battery comprises an inorganic fine oxide powder such as silica which may be located between the battery element and the casing (see [0031], [0033]). It is disclosed that the inorganic oxide functions to "effectively absorb the hydrofluoric acid and others." However, it is submitted that the oxide powder, in aggregate form, would also inherently function as a "gas absorbable member" as recited in claim 1. The battery electrodes contain carbon and a lithium composite oxide (see [0027]).

The reference does not expressly teach that the oxide powder is a continuous solid plate-like member forming first and second gas absorbable members, as recited in claims 1 and 5.

However, it is submitted that the artisan would be motivated to mix the inorganic oxide powder of EP '296 with a binder material to form solid plate-like continuous gas absorbable members. In [0031], the reference teaches that the powder may be present in the space between the battery in the case, but may also be present as an electrolyte or electrode additive. The artisan would recognize from this disclosure that it would be advantageous to include a binder such as resin for the loose powder present in the space between the case and the battery. Such a resin binder would allow the gas absorbable members to become self-supporting and would prevent migration of the powder to other parts of the battery. Accordingly, the use of resin to form gas absorbable members would be obvious to the skilled artisan.

EP '296 further does not expressly teach a winding type battery element as recited in claim 1, or that the outer laminated covering member contains a gas absorbable material comprising a molecular sieve or a silica gel mixed with a resin material, as also recited in claim 1.

Chaloner-Gill teaches a spirally-wound "jelly roll" type cell (see col. 3, line 45). As shown in Figure 1, a battery element (10) is contained in an outer covering member including a laminated film having an outermost layer and is sealed by heat seals. The outer covering member may be defined as the laminate including layers 64, 66, 68, 70, and 72 (see Fig. 5), and each outer covering member has a recess therein (see Figs. 3 and 4). The battery comprises a gas absorbing material which is mixed with a resin material and formed as a layer (62) between the "outer covering member" as defined above and the battery element (see col. 2, line 61; col. 6,

line 33). In the preferred embodiments, combined thickness of the seven layers (60-72) is less than about 500 microns or less than about 250 microns (see col. 9, line 39). In the case of the latter, the thickness of each layer is preferably 20-30 microns (see col. 9, line 42). The gas absorbing material may comprise an activated carbon material (see col. 8, line 13) or silica gel (see col. 9, line 11).

It is submitted that the artisan would be motivated to use the laminated outer covering member of Chaloner-Gill, which includes the silica gel gas absorbable material, in the battery of EP '296. In column 1, line 49, Chaloner-Gill discloses that "[a] laminate is provided for use as a protective covering for inhibiting penetration of oxygen and/or oxygen and water therethrough and is particularly suitable for protecting components of an electrochemical cell such as a lithium battery." Accordingly, the artisan would be motivated to use the laminated outer covering member of Chaloner-Gill, which includes the silica gel gas absorbable material, in the battery of EP '296.

Further, the use of a spirally-wound battery element as disclosed by Chaloner-Gill in the battery of EP '296 would be obvious to the skilled artisan. It is known that the use of a wound configuration allows the current density of the battery to be increased. As such, the use of a wound battery element in the battery of EP '296 would be rendered obvious.

Chaloner-Gill does not expressly teach that the gas absorbable material is present in an amount of 0.1 to 95 wt. percent on a basis of a weight of the resin material, or that the layer containing the gas absorbable material has a thickness of between 1-500 microns, as recited in claim 1.

However, the artisan would be motivated to use a suitable amount of gas absorbing material based on the size of the battery and/or electrode element, thereby rendering the claimed range obvious. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). In this case, it is known that an amount of gas absorbing material can be selected based upon the size of the battery, as shown by column 6, lines 26-35 of Bullock et al.:

The amount of the gel will vary from battery size to battery size within the guidelines of being a sufficient quantity to absorb all water vapor produced during the self-discharge reactions. For normal 12V automobile batteries having six cells, the amount could range between about 50 grams to 300 grams. One skilled in the art could readily select a desiccant quantity by knowing the battery size, plate construction and volume of electrolyte left in the battery after the dumping step.

Although Bullock relates to lead-acid batteries, its teachings regarding the battery size would be applicable to all batteries employing a gas absorbing agent. Accordingly, the artisan would be motivated to use a suitable amount of gas absorbing material in the battery of Chaloner-Gill, thereby rendering the range of claim 1 obvious.

Additionally, the thickness range recited in claim 1 is not considered to distinguish over the references. Claim 1 recites that the members have a thickness of between 1-500 microns. As noted above, Chaloner-Gill teaches that in a seven-layer construction, each sheet preferably has a thickness of less than about 500 microns (or less than about 250 microns). In the case of 500 microns, each sheet would have a thickness of about 70 microns. As such, this disclosure fairly suggests the claimed range of 1-500 microns.

EP '296 further does not expressly teach that the electrolyte is a gel electrolyte comprising vinylidene fluoride-hexafluoropropylene (PVDF:HFP) copolymer as recited in claim 1.

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The patent of Gozdz et al is directed to a lithium secondary battery. The battery may contain a gel electrolyte containing a PVDF:HFP copolymer and 20-70 wt% of a plasticizer containing an electrolytic salt (see abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Gozdz et al. provides the artisan sufficient motivation to use these materials in the battery of EP '296. In column 2, line 30, Gozdz et al. teach the following:

**The present invention provides a means for avoiding the disadvantages of prior electrolytic cell compositions and constructions by enabling the ready and economical preparation of strong, flexible polymeric electrolytic cell membranes which will readily retain electrolyte salt solutions and remain functional over a range extending well below room temperature.**

As such, the artisan would be motivated to use the electrolyte of Gozdz in the battery of EP '296.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP '296 in view of Chaloner Gill in view of Bullock in view of Gozdz et al. as applied to claims 1, 5, and 8-11 above, and further in view of Wedlake (U.S. Patent 4,269,905).

Neither EP '296 nor Chaloner-Gill expressly discloses that the battery contains a carbon molecular sieve, as recited in claim 4.

Wedlake is directed to electrochemical cells having a casing containing a layer of molecular sieve material. The molecular sieve may comprise materials such as zeolite and carbon (col. 3, line 59 et seq.).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the carbon molecular sieve of Wedlake as the gas absorbable material of EP '296/Chaloner-Gill. In the abstract, Wedlake discloses that "this invention involves associating a micromolecular sieve carrier with the cell to sorb such contents when they escape, to reduce the severity of undesired reactions of such contents." As such, the artisan would be motivated to use the materials disclosed by Wedlake, such as carbon molecular sieve, as the gas absorbable material of EP '296/Chaloner-Gill in hopes of obtaining these advantages.

### ***Response to Arguments***

4. Applicant's arguments filed April 1, 2008 have been fully considered but they are not persuasive. Applicants state that "[a]s described in Applicant's specification, Applicants' plate-like members beneficially provide improved volume energy efficiency compared to encasing a battery element with a gas absorbable material. [...] Thus, Applicants' plate-like members provide improved volume energy efficiency compared to *Nakane*." However, Nakane (EP '296) does not teach any specific configuration of the powder surrounding the battery. Thus, Applicant's comparison of the plate-like members to an encasing member is not germane to



Nakane. Further, the artisan would be sufficiently skilled so as to not use so much of the gas absorbable material so as to compromise the volumetric efficiency of the battery.

Applicants further state that there is no suggestion in Nakane to form the claimed plate-like member. The location of the powder in Nakane is substantially the same as that specified in the claims, the difference being that Nakane does not disclose a binding resin for its powder. However, this configuration is still believed to be obvious for the reasons stated above. Further, Nakane, as well as Chaloner-Gill, teach that the powder, when used in other locations in the battery, is combined with a resin (i.e., electrolyte or packaging layer). Therefore, it would be well within the skill of the art to employ a resin to contain the powder that is located between the battery element and package of Nakane. Further, the subject matter would have been obvious because a particular known technique (combining gas absorbable powder with a resin) was recognized as part of the ordinary capabilities of one skilled in the art. *KSR v. Teleflex*, 82 USPQ2d 1385, 127 S. Ct. 1727 (2007). The use of resin to form the gas absorbable material of Nakane into a “plate-like member” is within the skill of the art and would yield a predictable result. Accordingly, the rejection as stated above is believed to be proper.

***Conclusion***

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795  
July 1, 2008